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This listing of the claims replaces all prior versions in the application.

Listing of Claims:

1. (Currently Amended) A polishing apparatus comprising:
a rotatable turntable having a polishing pad;
a carrier head configured to cooperate with the polishing pad to hold a target workpiece to be polished in alignment with the polishing pad on the turntable; and
a magnetic field control unit comprising a plurality of spaced apart first magnetic field sources disposed inside the carrier head, for generating respective first magnetic forces, and a plurality of second magnetic field sources disposed inside the carrier head configured to generate respective second magnetic forces with each second magnetic field source comprising an electromagnet, a respective one of the plurality of second magnetic field sources being substantially spatially aligned with a respective one of the first magnetic field sources to define a magnetic field source pair, each magnetic field source pair being spaced apart from the others, wherein, in operation, the second magnetic field source in each magnetic field source pair is configured to selectively repel or attract the first magnetic field source such that, in operation, polarity of an electromagnet can reverse, and wherein, during operation, electromagnets in adjacent magnetic field source pairs have opposing polarity.
2. (Currently Amended) The apparatus according to claim 1, wherein the first magnetic field sources each comprise at least one permanent magnet, ~~and wherein the second magnetic field sources each comprise an electromagnet.~~
3. (Currently Amended) The apparatus according to claim 1, wherein the first magnetic field sources are statically held lower in the carrier head than the second magnetic field sources, with the second magnetic field source for each magnetic field source pair being positioned axially aligned with and above the corresponding first magnetic field source.
4. (Currently Amended) ~~The apparatus according to claim 1,~~
A polishing apparatus comprising:
a rotatable turntable having a polishing pad;

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a carrier head configured to cooperate with the polishing pad to hold a target workpiece to be polished in alignment with the polishing pad on the turntable; and
a magnetic field control unit comprising a plurality of spaced apart first magnetic field sources disposed inside the carrier head, for generating respective first magnetic forces, and a plurality of second magnetic field sources disposed inside the carrier head configured to generate respective second magnetic forces with each second magnetic field source comprising an electromagnet, a respective one of the plurality of second magnetic field sources being substantially spatially aligned with a respective one of the first magnetic field sources to define a magnetic field source pair, each magnetic field source pair being spaced apart from the others.

wherein the second magnetic field sources reside lower in the carrier head than the first magnetic field sources, with the first magnetic field source for each magnetic field source pair being positioned axially aligned with and above the corresponding second magnetic field source.

5. (Original) The apparatus according to claim 1, wherein the first magnetic field sources are substantially concentrically aligned with: a center permanent magnet; an intermediate permanent magnet surrounding an outer peripheral edge of the center permanent magnet; and an outer permanent magnet surrounding an outer peripheral edge of the intermediate permanent magnet, and wherein the second magnetic field sources are substantially concentrically aligned with a center electromagnet; an intermediate electromagnet arranged to surround an outer peripheral edge of the center electromagnet; and an outer electromagnet arranged to surround an outer peripheral edge of the intermediate electromagnet.

6. (Original) The apparatus according to claim 5, wherein an insulating material, film and/or coating is positioned between adjacent magnetic field source pairs to substantially magnetically insulate the different magnetic field pairs from each other.

7. (Currently Amended) The apparatus according to claim 1, further comprising:

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a polishing film thickness detector unit with a plurality of spaced apart sensors positioned proximate a polishing surface of the target workpiece for detecting a thickness of a polishing film of the target workpiece, the polishing film thickness detector unit operatively associated with the magnetic field control unit; and

a magnetic force adjustment unit configured to selectively control the polarity and[[/or]] magnetic force generated by each of the second magnetic field sources responsive to the detected thickness of the polishing film provided by the polishing film thickness detector unit.

8-11 (Canceled)

12-38 (Canceled)

39. (New) An apparatus according to Claim 1, wherein there are three spaced apart magnetic field source pairs in the carrier head, a first center magnetic field source pair comprising a substantially cylindrical center permanent magnet, a second intermediate field source pair comprising an annular intermediate permanent magnet, and a third outer field source pair comprising an annular outer permanent magnet.

40. (New) An apparatus according to Claim 1, wherein the first magnetic field sources are permanent magnets, and wherein the permanent magnets are substantially static in the carrier head during operation.

41. (New) A polishing apparatus comprising:
a rotatable turntable having a polishing pad;
a carrier head configured to cooperate with the polishing pad to hold a target workpiece to be polished in alignment with the polishing pad on the turntable; and
a magnetic field control unit comprising three spaced apart magnet regions disposed inside the carrier head, each region holding a magnet field source pair, each magnet field source pair comprising at least one permanent magnet for generating a first magnetic force,

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and an aligned corresponding electromagnet configured to generate a second magnetic force, wherein, in operation, the electromagnet in at least one magnetic field source pair is configured to alter polarity to selectively repel or attract the corresponding at least one permanent magnet.

42.(New) An apparatus according to Claim 41, wherein there are three magnetic field source pairs, a first center magnetic field source pair comprising a substantially cylindrical center permanent magnet, a second intermediate field source pair comprising an annular intermediate permanent magnet, and a third outer field source pair comprising an annular outer permanent magnet.

43. (New) An apparatus according to Claim 41, wherein the permanent magnets in each field source pair are substantially static during operation.

44. (New) An apparatus according to Claim 41, wherein, in operation, the electromagnet in each magnetic field source pair is configured to selectively repel or attract the first magnetic field source such that, in operation, polarity of the electromagnet can reverse.

45. (New) An apparatus according to Claim 41, wherein, during operation, electromagnets in adjacent magnetic field source pairs have opposing polarity.

46. (New) A polishing apparatus comprising:
a rotatable turntable having a polishing pad;
a carrier head configured to cooperate with the polishing pad to hold a target workpiece to be polished in alignment with the polishing pad on the turntable; and
a magnetic field control unit comprising a plurality of spaced apart first magnetic field sources disposed inside the carrier head, for generating respective first magnetic forces, and a plurality of second magnetic field sources disposed inside the carrier head configured to generate respective second magnetic forces with each second magnetic field source

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comprising an electromagnet, a respective one of the plurality of second magnetic field sources being substantially spatially aligned with a respective one of the first magnetic field sources to define a magnetic field source pair, each magnetic field source pair being spaced apart from the others, wherein, in operation, the second magnetic field source in each magnetic field source pair is configured to selectively repel or attract the first magnetic field source such that, in operation, polarity of an electromagnet can reverse.

47. (New) An apparatus according to Claim 46, wherein there are three magnetic field source pairs, a first center magnetic field source pair comprising a substantially cylindrical center permanent magnet, a second intermediate field source pair comprising an annular intermediate permanent magnet, and a third outer field source pair comprising an annular outer permanent magnet.

48. (New) An apparatus according to Claim 46, wherein the first magnetic field sources are permanent magnets, wherein the permanent magnets are substantially static in the carrier head during operation, and wherein the intermediate permanent magnet has a different polarity from the center and/or outer permanent magnet.